



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,672	03/05/2002	Brian Jay Tillotson	7784-000379	7241
27572	7590	11/28/2005	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303			DYKE, KERRI M	
			ART UNIT	PAPER NUMBER
			2667	

DATE MAILED: 11/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/091,672	Applicant(s) TILLOTSON, BRIAN JAY	
	Examiner Kerri M. Dyke	Art Unit 2667	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 March 0202.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/02/03, 1/29/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 5, and 19-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Cain et al. (US 2003/0193919).
3. In regards to claim 1, Cain discloses a time division multiple access (TDMA) based network backbone comprising: a plurality of nodes including a plurality of receive antennas for receiving a plurality of radio frequency (RF) bursts and a plurality of transmit antennas for transmitting said RF bursts; a node control for communicating information relating to said nodes; a timing reference subsystem for providing timing signals to said nodes; said receive antennas operated in accordance with a plurality of receiving slots and said transmit antennas operated in accordance with a plurality of transmitting slots; and a plurality of links interconnecting said nodes (figures 1-2 and paragraph 0011).
4. In regards to claim 5, Cain et al. discloses the network backbone of claim 1, wherein a plurality of said nodes transmit simultaneously (paragraph 0186).
5. In regards to claim 19, Cain et al. discloses a method for dynamically adjusting link capacities for a time division multiple access (TDMA) network backbone, comprising:

Art Unit: 2667

estimating a needed modification in a total plurality of TDMA slots of a given transmission link for adjusting a link capacity of said given transmission link to accommodate a desired transmission link capacity; sending a modification request from a first node of said given transmission link to a second node of said given transmission link; updating a current status of said second node to accommodate a desired transmission link capacity; and sending a status message from said second node to said first node (paragraphs 0137-0170).

6. In regards to claim 20, Cain et al. discloses the method of claim 19 wherein said step of updating a current status, comprising: constructing a send times block by said first node for determining starting times for transmissions from said first node to said second node; updating a physically acceptable transmit list for additional required TDMA slots on said first node; sending a request to said second node for additional transmit capacity along with updated said physically acceptable transmit list; constructing a physically acceptable receive list from a comparison of a plurality of available receive TDMA slots on said second node with said physically acceptable transmit list; truncating said acceptable receive list to match said request for additional transmit capacity; sending said acceptable receive list to said first node; and using additional capacity if said acceptable receive list contains at least one additional slot (paragraphs 0137 – 0170).

7. In regards to claim 21, Cain et al. discloses the method of claim 19 wherein said step of updating a current status, comprising: using said first node to estimate a plurality of transmit TDMA slots and a plurality of receive TDMA slots to be removed to reduce link capacity; selecting said transmit TDMA slots and said receive TDMA slots to be removed by said first node based on a user-defined criteria; sending to said second node a request for removing certain of said transmit TDMA slots and certain of said receive TDMA slots; causing said second node

Art Unit: 2667

to remove said certain TDMA transmit slots and said certain TDMA receive slots by said second node; sending an acknowledgement of removal of said certain TDMA transmit and TDMA receive slots from said second node to said first node; and ceasing the use of said certain TDMA transmit slots and said certain TDMA receive slots by said first node and said second node (paragraphs 0137 – 0170).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cain et al. (US 2003/0193919) in view of Walsh (WO 94/08405).

10. In regards to claim 2, Cain et al. discloses the network backbone of claim 1, but not wherein said timing reference subsystem comprises a global positioning system.

Walsh discloses a GPS timing system in figure 1 elements 106, 107, and 108.

It would have been obvious to one of ordinary skill in the art to use a GPS timing system because doing so maintains a high degree of accuracy (abstract) and costs much less than an oscillator, as taught by Walsh in page 2 lines 1-2.

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cain et al. (US 2003/0193919) in view of Shimasaki et al. (US 3,789,142).

12. In regards to claim 4, Cain et al. discloses the network backbone of claim 1, but not wherein receiving times for said RF bursts are aligned to boundaries of said receiving slots.

Art Unit: 2667

Shimasaki et al. disclose the RF bursts being aligned to the boundaries of said receiving slots in figure 2.

It would have been obvious to one of ordinary skill in the art to align the transmission bursts because doing so eliminates the need for onboard synchronization, as taught by Shimasaki et al. in column 3 lines 59-63.

13. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cain et al. (US 2003/0193919) in view of Campanella et al. (US 4,792,963).

14. In regards to claim 7, Cain et al. discloses the network backbone of claim 1, but not wherein each of said nodes further comprising: a clock for providing backup timing signals.

Campanella et al. teaches using a clock for backup timing in column 6 lines 23-28.

It would have been obvious to one of ordinary skill in the art to use a clock for backup timing in order to correct the satellite timing, as taught by Campanella et al. in the abstract.

15. Claims 3, 6, and 8-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cain et al. (US 2003/0193919) in view of Vatt et al. (EP 0 571 740, provided by applicant).

16. In regards to claim 3, Cain et al. discloses the network backbone of claim 1, but not wherein transmitting times for said RF bursts are aligned to boundaries of said transmitting slots.

Vatt et al. discloses transmitting times for said RF bursts being aligned with the boundaries of said transmitting slots in column 3 lines 1-14.

It would have been obvious to one of ordinary skill in the art to choose the transmitting times to align with the transmitting slots because doing so allows for information being exchanged between the nodes to arrive within a similar time period at either end, as taught by Vatt et al. in column 3 lines 1-14.

Art Unit: 2667

17. In regards to claim 6, Cain et al. discloses the network backbone of claim 1, but not wherein a duration of said RF bursts is shorter than a time of flight (TOF) between said nodes.

Vatt et al. teaches the duration of the burst being less than the TOF in column 10 lines 15-20.

It would have been obvious to one of ordinary skill in the art to schedule the RF burst for less than the TOF because doing so allows the antenna to switch from transmit mode to receive mode, which eliminates the need for separate antennas, as taught in column 8 lines 25-30.

18. In regards to claim 8, Cain et al. discloses a method of forming a TDMA based network backbone, comprising: sending an orderwire message from a first node selected from a plurality of nodes to other nodes of said plurality of nodes, said first node using a node control for sending said orderwire message to said other nodes; selecting a second node to form a link, said second node having a plurality of second transmit slots and a plurality of second receive slots; sending an orderwire message from said first node to said second node offering a plurality of first transmit slots and a plurality of first receive slots to said second node; and sending a status message from said second node to said first node (figure 5).

Cain et al. does not disclose calculating time-of-flight of a transmission from said first node to said second node using locations of said first node and said second node.

Vatt et al. teaches using a TOF for burst duration in column 10 lines 15-20, therefore the TOF has been calculated.

It would have been obvious to one of ordinary skill in the art to calculate the TOF as taught by Vatt et al. for use in the communication system of Cain et al. because doing so allows

the same antenna to be used for both transmitting and receiving because the RF bursts can be made less than the TOF, as taught by Vatt et al. in column 8 lines 25-30.

19. In regards to claim 9, Cain et al. discloses the method of claim 8, further comprising the steps of: forming an acceptable receive list after comparing said first transmit slots with said second receive slots; and forming an acceptable transmit list after comparing said first receive slots with said second transmit slots (paragraphs 0114-0116, figure 7, table 5).

20. In regards to claim 10, Cain et al. discloses the method of claim 9, wherein: said status message comprises an acceptance message if said acceptable receive list and said acceptable transmit list are not empty, said acceptance message including said acceptable receive list and said acceptable transmit list (table 5).

21. In regards to claim 11, Cain et al. discloses the method of claim 9, wherein: said status message comprises a rejection message if said acceptable receive list is empty. Paragraph 0130 discloses a negative CONFIRM message, which is a rejection message.

22. In regards to claim 12, Cain et al. discloses the method of claim 9, wherein: said status message comprises a rejection message if said acceptable transmit list is empty. Paragraph 0130 discloses a negative CONFIRM message, which is a rejection message.

23. In regards to claim 13, Cain et al. discloses the method of claim 9, further comprising the step of: applying a user defined rule to said acceptable receive list and said acceptable transmit list. Paragraph 0062 discloses using a priority scheme for link establishment.

24. In regards to claim 14, Cain et al. discloses a method for communicating over a TDMA based network backbone, comprising: determining a location for each one of a plurality of nodes, a plurality of each of said nodes including a node control for determining node location;

Art Unit: 2667

transmitting a plurality of RF bursts from said sending node to said receiving nodes using a plurality of transmitting phased array antennas (PAAs), said transmitting PAAs operating in accordance with a plurality of transmitting slots; and receiving a plurality of RF bursts from said sending node, using a plurality of receive phased array antennas (PAAs), said receive PAAs operating in accordance with a plurality of receiving slots. (figures 1-2, paragraphs 0011, 0066).

Cain et al. does not disclose calculating a time-of-flight between a sending node of said plurality of nodes, and a sub plurality of receiving nodes of said plurality of nodes.

Vatt et al. teaches using a TOF for burst duration in column 10 lines 15-20, therefore the TOF has been calculated.

It would have been obvious to one of ordinary skill in the art to calculate the TOF as taught by Vatt et al. for use in the communication system of Cain et al. because doing so allows the same antenna to be used for both transmitting and receiving because the RF bursts can be made less than the TOF, as taught by Vatt et al. in column 8 lines 25-30.

25. Claim 15 is rejected upon the same grounds as claim 4.

26. Claim 16 is rejected upon the same grounds as claim 3.

27. In regards to claim 17, Cain et al. discloses the method of claim 14, further comprising the step of: spacing the RF bursts to avoid overlapping one another (paragraphs 0031 and 0042).

In regards to claim 18, Cain et al. discloses the method of claim 14, wherein said step of transmitting, further comprising: managing transmission times so that a single said transmitting PAA is restricted from attempting to simultaneously transmit to any two of said nodes.

Paragraph 0042 discloses that each PAA should transmit to only one node. If the PAA can be

Art Unit: 2667

heard by another node, it is creating interference. If the interference is above a threshold value the PAA will not be allowed to continue transmission.

28. Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Voce (US 6, 246, 874) in view of Cain et al. (US 2003/0193919).

29. In regards to claim 22, Voce discloses a method for maintaining a communication link between two nodes in the event of a change in a location of at least one of said two nodes, comprising: tracking, by a first node, a change in an angular position and an angular rate of movement of each of a plurality of links relative to a field-of-regard of a first antenna of said first node, said first node selected from a plurality of nodes; predicting a cross-over by each of said links confined within said field-of-regard of said first antenna into said field-of-regard of a second antenna associated with said first node; estimating a time of occurrence of said cross-over; and operating said link between said first node and said second node beginning at said estimated time of said cross-over (column 2 lines 50-61 and column 3 lines 16-33). Voce does not explicitly disclose tracking the rate of movement, but such information must be calculated in order to determine the time for handoff.

Voce also does not disclose communicating by said first node a first list of a plurality of available slots associated with said second antenna and an estimated time of said cross-over to a second node selected from said nodes; identifying, by said second node, a plurality of acceptable slots from said first list offered by said first node to create a second list; communicating, by said second node, said second list of said acceptable slots to said first node.

Cain et al. discloses forming a list of acceptable slots in paragraphs 0114-0116, figure 7, and table 5.

It would have been obvious to one of ordinary skill in the art to modify the handoff system of Voce to include the slot selection method of Cain et al. because Cain et al.'s method of scheduling is an improvement and also allows for better handling of unbalanced loads, as taught in paragraph 0010. It is also disclosed in paragraph 0054 that it is known by Cain et al. to use a pointing/tracking system in conjunction with the scheduling method, but the particulars of the system are not disclosed.

31. In regards to claim 23, Voce and Cain et al. disclose the method of claim 22 wherein said first antenna comprises a phased array antenna (Cain et al. figure 2 element 16).

32. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Voce (US 6, 246, 874) in view of Cutler, Jr. et al. (US 5,678,184).

33. In regards to claim 24, Voce discloses tracking the need for handoff, tracking the motion of the nodes, and predicting a time for the handoff to take place (column 2 lines 50-61 and column 3 lines 16-33). Voce does disclose using handoff to ensure a high quality of service, which can include handing off to avoid the overlap and ensuing interference. Voce does not disclose the handoff occurring because of interference due to overlap.

Cutler, Jr. et al. discloses reassigning transmissions and shutting down channels to avoid interference when cells overlap in column 7 lines 1-12.

It would have been obvious to one of ordinary skill in the art to include cell overlap and interference, as taught by Cutler, Jr. et al. as a reason to initiate handoffs, as taught by Voce because doing so will ensure the quality of the call is maintained, the desirability of which is expressed by Voce in column 1 lines 30-40.

Art Unit: 2667

34. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Voce (US 6, 246, 874) in view of Cutler, Jr. et al. (US 5,678,184) further in view of Cain et al. (US 2003/0193919).

35. In regards to claim 25 Voce and Cutler, Jr. et al. disclose the method of claim 24. Cutler, Jr. et al. discloses assembling a list of slots to be discontinued and transmitting the list in column 7 lines 1-20. Voce discloses stopping the transmissions at a predetermined time in column 2 lines 50-61 and column 3 lines 16-33. Voce and Cutler, Jr. et al do not disclose wherein said step of reassigning comprises: identifying a plurality of transmission slots available on said first node at the time of occurrence of said overlap, said transmission slots being associated with said first antenna, said transmission slots being intervals for transmission of said RF, said transmission slots including a selection of said transmission slots becoming available upon resolving of said overlap; creating a first list comprised of said plurality of transmission slots available on said first node; identifying, by said third node, acceptable said transmission slots from said first list of said transmission slots communicated by said first node for creating a third list; communicating, by said third node, said third list of said slots to said first node.

Cain et al. discloses forming a list of acceptable slots and using the slots to establish communication links in paragraphs 0114-0116, figure 7, and table 5.

It would have been obvious to one of ordinary skill in the art to modify the handoff system of Voce and Cutler, Jr. et al. to include the slot selection method of Cain et al. because Cain et al.'s method of scheduling is an improvement and also allows for better handling of unbalanced loads, as taught in paragraph 0010.

Conclusion

36. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Stott et al. (US 4,090,036) discloses a method wherein a first node sends a list of available slots to a second node. The second node chooses the slot it is capable of using and indicates its choice to the first node.
- b. Chieu et al. (US 5,515,366) discloses means for two terminals to find a mutually agreeable time slot for communication if a base station is unavailable.
- c. Yamata et al. (US 2002/0067709) discloses a method wherein a table of available time slots is maintained. A slot is chosen in response to a request and the table is updated to reflect the fact that the slot is now in use.
- d. Natarajan et al. (US 5,790,070) discloses a method for satellite communication in which the time slots are dynamically assigned in real-time based upon requests for bandwidth.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kerri M. Dyke whose telephone number is (571) 272-0542. The examiner can normally be reached on Monday through Friday, 8:00 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on (571) 272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2667

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

kmd


CHI PHAM
SUPERVISORY PATENT EXAMINER
ELECTRONIC BUSINESS CENTER
11/21/05